Personal finance concepts and other

Question no Joe won a lottery jackpot that will pay him $12, 000 each year for the next ten years. If the market interest rates are currently 12%, how much does the lottery have to invest today to pay out this prize to Joe over the next ten years

According to the question the data is as follows:

Yearly payment = R =$12000

Interest rate = i = 12% or 0. 12

No. of years = n = 10

Present value = PV =

The formulae for PV is

PV= R [{1-1/ (1+i) n }/i]

PV= 12000[{1-1/ (1. 12)10} /0. 12]

PV=$67802. 676

The lottery manager should invest $ 67802. 676 now to pay off the future liabilities for ten years. $67802. 676 will grow at a 12% annum and will able the lottery manager to make yearly payment of $12000.

Following is the schedule of investment and payment:

Year

Investment $

Rate (i)

Interest $

Total $

Payment (R) $

Balance $

1

67802. 60

0. 12

8136. 31

75938. 91

12000. 00

63938. 91

2

63938. 91

0. 12

7672. 67

71611. 58

12000. 00

59611. 58

3

59611. 58

0. 12

7153. 39

66764. 97

12000. 00

54764. 97

4

54764. 97

0. 12

6571. 80

61336. 77

12000. 00

49336. 77

5

49336. 77

0. 12

5920. 41

55257. 18

12000. 00

43257. 18

6

43257. 18

0. 12

5190. 86

48448. 04

12000. 00

36448. 04

7

36448. 04

0. 12

4373. 76

40821. 81

12000. 00

28821. 81

8

28821. 81

0. 12

3458. 62

32280. 42

12000. 00

20280. 42

9

20280. 42

0. 12

2433. 65

22714. 07

12000. 00

10714. 07

10

10714. 07

0. 12

1285. 69

11999. 76

12000. 00

-0. 24

QUESTION NO: 2 Mary and Joe would like to save up $10, 000 by the end of three years from now to buy new furniture for their home. They currently have $2500 in a savings account set aside for the furniture. They would like to make equal year end deposits to this savings account to pay for the furniture when they purchase it three years from now. Assuming that this account pays 8% interest, how much should the year end payments be Marry and Joe would to save $10000 by the end of 3 years currently they have $2500 in their savings which will grow at a rate of 8% per annum and will grow to $3149. 28.

Data:

PV= 2500

Rate= 8% or 0. 08

N = 3 years

Calculation:

Future value: present value $(1+i)^n$

FV= 2500 $(1+0. 08)^3$

FV= 3149. 28

The 2500 of the savings will grow to 3149. 28 but they are still less than

$10000

10000-3149. 28= 6850. 72

They need $10000 by the end of 3 years but still short $6850. 72.

They should make yearly savings to purchase the furniture after 3 years

Data:

FV= 6850. 72

Rate = i = 8% or 0. 08

n = 3

Payment = R =

Calculation:

FV = R $[\{(1+i)^n -1\} /i]$

6850. 72= R $[\{1+0. 08)^3 - 1\}/ 0. 08]$

Solving for R,

R = 6850. 72/3. 2464

R = 2110. 25

Marry and Joe should save $2110. 25 each year for 3 years and invest at 8%

to grow them to $6850. 72

So the initial savings of $2500 and yearly savings of $2110. 25 will grow to

$10000 by the end of three years and will able them to purchase furniture.

$3149. 28+$6850. 72=$10000